

Review

# Impact of compensation incentives on corporate cash holdings: Evidence from non-financial listed companies at Karachi Stock Exchange

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This study examined the relationships between corporate cash holdings (corporate liquidity policy) and compensation incentives, offered by Karachi Stock Exchange listed non-financial companies, to their CEOs, Directors and Executives, keeping in view the managerial shareholding of the firm, levered capital structure and firm size. The regression results suggested that the CEO Compensation and Executive Compensation have a significant positive relationship with Corporate Cash Holdings. Size of the firm - a control variable - also has a significant positive relationship with Corporate Cash Holdings. We however, found that Leverage and Managerial Shareholdings have a significant negative relationship with the Corporate Cash Holdings. It is concluded that management of the companies do have influence on Corporate Cash Holdings positively, but at the expense of debt holders, as we have observed a significant negative relationship between leverage and corporate cash holdings viz-a-viz corporate liquidity policy. Another important conclusion drawn from the observed results is that managers having share in the ownership of the companies tend to influence the corporate liquidity policy of the companies.

**Key words:** Karachi Stock Exchange, compensation incentives, corporate liquidity policy.

## INTRODUCTION

### Background

It is generally an acceptable phenomenon that managers should make those decisions related to financing and investment due to which the market value of capital is maximized. In practical world, managers who are risk averse and do not believe in diversification may forgo net

present value with more risk and prefer those choices in which less risk is involved and in some cases the net present value is often negative. The compensation based on equity helps in overcoming the risk aversion of managers and so they do more alignment of their interests with interests of shareholders, but due to this type of compensation the conflicts among stockholder

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and bondholder may get aggravated. Compensation based on equity and particularly stock options can aggravate incentives which shift the risk, motivating managers for adopting risky policies due to which the market value of firm's capital can be increased. Researchers have been finding from longer period of time that how possible is the bad incentive impacts of compensation based on equity on the choices of company policy and how bondholders try mitigating or protecting themselves from the feasible negative results of these choices. The liquidity policy of company would consider to be the perfect although more ignored policy in which exploring the relationship between incentives related to compensation and conflicts among stockholder and bondholders (Francis et al., 2015).

Most of the companies hold assets in the form of cash. At one side, since the decision of holding and deploying cash to great extent at the choice of management with less external scrutiny, the risk averse cash policy and managers with less diversification may be different from the preference of shareholders. In efficient structure of compensation there must be alignment between managers' interests and interest of shareholders. This helps in limiting the investment in the form of cash to funds which are required for supporting operations (Tong, 2010).

Literature on finance found that maintaining an optimal level of liquid assets is always a challenge for firm managers and it remained on the discretion of managers to hold what level of cash assets to maintain. Keeping in view the agency perspective, Quigley (2008) said that the decision to hold assets in the form of cash (large amount of cash or less amount of cash) rests on the discretion of the management of the firms. Cash is mainly required for running day to day business of the firms and they prefer more cash on less to avoid liquidity risk, that is, a risk arising from non fulfillment of liabilities in time. Liu and Mauer (2011) recently found links between compensation incentives and stockholder-bondholder conflicts by exploring the corporate liquidity policy. Managers having no equity compensation participation would be risk averse and under diversified (Liu and Mauer, 2011). However, managers having equity based compensations can adopt risky policy choices to increase the market value of equity at the expense of bond holders (Quigley, 2008).

### **Problem statement**

The primary objective of the firm managers is to maximize the shareholders' wealth, whereas in practice, risk averse managers usually avoid those projects having risky positive net present value. For the purpose to overcome the issue of risk aversion by the firm managers, equity based compensation plans are to be used (Tong, 2010). In this way managers' interest are got in line with the interests of the shareholders as managers

also participate in risk taking. However, risk taking by managers, adds value to the shareholders wealth at the cost of debt holders' interests and this results in agency problems between shareholders and bond holders' interests (Liu and Mauer, 2011). In a lot of documented efforts, it was found that a significant relationship exists between equity based compensation incentives and corporate policy choices and its subsequent effects on the interests of the bond holders. Research studies on corporate finance are continuously exploring the determinants of compensation incentives of managers and its impact on corporate policy choices. Our concern in this study is mainly to focus on corporate liquidity policy.

### **Objective of research**

The objective of this study is to explore the significant relationships between Compensation Incentives and Cash Holdings of the firms, keeping in view the stockholder-bondholder conflicts and ownership of the firms held by managers, in Pakistani perspective.

### **Significance of research**

Our study makes different contributions in the literature. First of all, the study is beneficial for all the non-financial companies listed in KSE. This would help them in knowing how compensation incentives can have an impact on corporate cash holdings. The focus of the study is on "liquidity policy" due to which a new view will be provided that relationships between stakeholders of firm can get affected. The analysis will help to know how the CEO compensation incentives can affect the level as well as value of cash holdings.

### **LITERATURE REVIEW**

Yu et al. (2013) suggested that conflicts arise among shareholders and bondholders, when managers make those decisions that best fit the stockholders' interests at the expense of bondholders' interests. Four main sources of conflict between bondholders and stockholders identified by Yu et al. (2013) are dividend payouts, claim dilution, asset substitution and underinvestment. Conflict of interest also arises among managers and shareholders. They found that there are three conflicts which arise among managers and claimholders of the firm. Firstly managers opt to have a choice of effort. Secondly, managers are more concerned about the total risk faced by the firm, as it is a fact that investment in firm specific human capital is characterized by a significant portion of the managers wealth; whereas the shareholders diversify away most of the risks they face. Consequently, a

manager makes those decisions which help out the firms to diversify their risks. Thirdly, conflicts arise among managers and shareholders, due to difference of perspectives.

### **Chief executive officer's compensation incentives**

Historically, financial literature suggested that elementary transformations in the culture of corporations occurred when employees participated in firm ownership, holding the value of the firm constant as argued by O' Dowd (2008). He further elaborated that firms having growth in sales of about 10% raise the remunerations of its CEOs by 2 to 3%. They also found that the relationship between size of the firm and pay of the CEO is causal. CEOs are found to increase their remuneration as the firm's size increased, no matter if the market value of the firm is falling.

In exploring the links between compensation of CEOs and firms' specific risks, it was found that pay performance sensitivity decreases firm specific risks (Jin, 2002). It also suggested increase in the incentives of managers, when a firm's market risk level increases. Jin (2002) documented that the higher the productivity of efforts the higher the pay performance sensitivity. In a comparative study, keeping in view the impact of CEOs' compensation incentives on firms' performance, Kato and Kubo (2006) found significant relationships between CEOs' compensation and the performance of the firms in Japan. He suggested that the estimation of elasticity in the CEOs' cash compensation with regard to shareholder value does appear, that the link of CEOs' pay to stock market performance is weaker in Japan as compared to United States and the bonus system of Japan makes CEOs' compensation more sensitive to firms' performance.

Shah et al (2009) explored the determinants of CEOs' compensation in Pakistani perspective and found that performance variables are insignificant in explaining CEOs' compensation; however, size affects CEOs' compensation positively. Corporate governance represented by various proxies also has significant impact on compensation of CEOs.

### **Corporate cash holdings**

Various studies have been conducted to determine the optimum level of corporate cash holdings and factors affecting cash holding of the firms. Francis et al. (2015) argued that firms need liquidity to defray their current expenses. Firms have to raise funds in capital markets or to liquidate existing assets. But, there are imperfections in capital markets and transaction costs are also involved. These can be avoided by holding sufficient amount of cash assets. One could expect firms to increase their cash holdings as outside funds are

expensive and the access to capital markets is difficult.

In recent decades, Di and Hanke (2013) found that firms having strong growth opportunities, riskier activities, and small size tend to hold comparatively more cash. On the other hand, firms having maximum access to the capital market, large sized with good credit ratings hold less cash. He suggested that the companies choose to hold more liquid assets with an objective to invest in days when cash flows will be low, relative to long term investments or due to the reason that outside funds are relatively expensive. On the other hand, Isshaq et al. (2009) argued that an additional unit of cash holdings does not have any statistically significant impact on share prices, return of additional cash to shareholder or on investing it in those projects which look financially viable and preferred to storing it on the balance sheet.

Islam (2012) suggested that firms hold cash due to certain reasons, most important among which is to fulfill immediate financial obligations. In his study in Bangladeshi context, Tobin's Q, net working capital and cash flows volatility were found insignificant in determining cash holdings of the manufacturing firms. However, assets (current asset, intangible asset, and net cash), debt (short term debt, total debt), operating income, size, leverage ratio and tangibility ratio were found to be significantly affecting cash holding of the firms.

Likewise, Bigelli and Sánchez-Vidal (2012) in search of determinants of corporate cash holdings found that those firms characterized by smaller size, riskier cash flows and lower effective tax rates hold significantly higher amount of cash reserves. Moreover, firms with higher financing deficits hold significantly lower amounts of cash.

### **Links between compensation incentives and corporate cash holdings**

The possibility of any link between compensation incentives and corporate cash holding is still ambiguous as various viewpoints are found in literature. A prominent study found on corporate cash holdings and corporate governance is that of Ozkan and Ozkan (2004), where he found that managerial ownership plays an important role in determining corporate cash holdings in UK firms; however, this relationship was found to be non-monotonic. Other corporate governance variables such as board composition and the presence of ultimate controllers are found not to be significant in explaining corporate cash holdings. An important finding by Ozkan and Ozkan (2004) was that higher cash holdings are associated with lower levels of bank debt and leverage. In continuation, Dittmara and Mahrt-Smith (2007) also explored the relationship between corporate governance and the value of cash holdings. They found that the value of a dollar of cash is substantially less, if a firm has poor corporate governance. Moreover, poorly governed firms waste access cash resources and thus destroy firms'

**Table 1.** Descriptive statistics.

	CHOLD	CECOM	DRCOM	EXCOM	MHOLD	SZ	LEV
Mean	18.05940	14.14550	12.56322	16.06539	0.236645	22.27816	0.612775
Maximum	23.50880	21.31110	22.09520	23.70230	2.060300	26.29420	0.992500
Minimum	10.81980	0.000000	0.000000	0.000000	0.000000	18.59780	0.005900
Std. Dev.	2.378510	4.732399	6.175887	4.952968	0.281626	1.383934	0.208949
Observations	420	420	420	420	420	420	420

value (Al-Amarnah, 2015). He suggested that the cash policy may matter very little whether a firm holds excess cash-if it is well governed.

Contrary to the above, Acharya et al. (2007), in their seminal work, found that cash holdings play an important role in the optimization of firms' financial policies and there is an important hedging dimension to standard financial policies such as cash and debt in the presence of financing frictions. Harford et al. (2008), however, found that firms' cash position and their governance affect the future profitability. In his findings he suggested that low insider ownership is negatively related to firms' value and the presence of excess cash does not exacerbate the relation.

To highlight the risk preferences of CEOs in a firm, Quigley (2008) suggested that CEOs' risk-preferences affect leverage and cash-holding policies and CEOs' risk-preference, arising out of his personal portfolio of stocks and options in the firm, influences the firm's cash holding policies in a significant manner. Liu and Mauer (2011) argued that those firms which promote risk-taking by CEOs tend to hold more cash keeping all else constant. He further confirmed that firms with low cash holdings tend to be large, have high working capital, and have larger acquisition activity. His results are found consistent with the costly contracting hypothesis, which states that bondholders expect higher risk-taking in those firms which have high Vega, thus involved higher liquidity (McCormack, 2008). They stated that benefits of cash to equity holders of financially constrained high Vega firms to compensate for the benefit that greater liquidity provides to the bond holders.

### Data and descriptive statistics

Annual Reports of 183 non-financial companies listed at KSE for the year 2009 to 2011 were analyzed and data on the observing variables were collected. Few companies are excluded from the sample due to missing information against some variables. Companies which have negative equity are also excluded from the sample as eliminated by Faulkender and Wang (2006) and Liu and Mauer (2011). The finalized sample consists of 140 companies x 03 years. Descriptive statistics of the variables used in the analysis are reported in Table 1.

**Corporate Cash Holding (CHOLD):** Data regarding Corporate Cash Holdings, the dependent variable is taken from the balance sheets of the companies. Corporate Cash Holdings are measured as a ratio of cash to net assets, where net assets comprised total assets minus cash. Opler et al. (1999) and Liu and Mauer (2011) measured corporate cash holdings as a sum of cash plus marketable securities. But we considered only cash to measure the corporate cash holdings viz-a-viz corporate liquidity policy as cash is most liquid asset (not need further conversion).

**Compensation Incentives:** We followed Liu and Mauer (2011), but not remained limited to them, as we employed CEO Compensation (CECOM) as well as Directors Compensation (DRCOM) and Executive Compensation (EXCOM) in our study also. The compensation package of CEOs, Directors and Executives of the Pakistani listed non-financial companies includes managerial remuneration, retirement benefits, utilities, medical expenses and leave encashment. Data regarding Compensation of CEOs, Directors and Executives are provided in the notes to the financial accounts of the companies, as it is mandatory to disclose under the Code of Corporate Governance in Pakistan. For the purpose of analysis, we took log of all these variables i.e. CEO, Director and Executive Compensation.

Leverage, Managerial Shareholdings and Firm size are used as control variables. Leverage (LEV) is measured as sum of long term and short term debt divided by the book value of assets. Data regarding leverage are also collected from annual financial statements. Managerial Shareholding (MHOLD) is worked out as percentage shares held by managers, CEOs etc. Data regarding managerial shareholding are collected from the pattern of shareholdings annexed with the annual reports of the companies. As far as firm size (SZ) is concerned, it is calculated with the same methodology used by Bates et al. (2009) and Liu and Mauer (2011). It is measured by taking logarithm of net assets of the companies. Descriptive Statistics of the variables are presented in Table 1.

### Pearson correlation

The Pearson Correlation test is carried out to see how

**Table 2.** Pearson correlation results.

	CHOLD	CECOM	DRCOM	EXCOM	MHOLD	SZ	LEV
CHOLD	1.000000						
CECOM	0.165333	1.000000					
DRCOM	0.048845	0.260884	1.000000				
EXCOM	0.301754	0.130718	-0.006932	1.000000			
MHOLD	-0.404544	-0.165985	0.024021	-0.273977	1.000000		
SZ	0.642469	0.052129	0.061665	0.333057	-0.279501	1.000000	
LEV	-0.285778	-0.118500	-0.037736	-0.127451	0.113628	-0.030247	1.000000

much correlation existed among the variables. Results of Pearson Correlation are given in Table 2.

The correlation test conducted on our data showed that some independent variables have a positive correlation with the dependent variable, that is, Corporate Cash holdings and some have a negative correlation with it. CEO compensation (CECOM) has a low positive correlation with corporate cash holdings (CHOLD). Same is the case with Director Compensation (DRCOM); its value is 0.04 and age is 0.029. Executive Compensation (EXCOM), however, has a slightly higher correlation with corporate cash holdings. Its value is 0.30. The highest positive correlation is found between size and corporate cash holding as evidenced from its value, 0.64. A negative correlation is found between managerial shares holding (MHOLD); its value is -0.40. Leverage is also found to be negatively correlated with corporate cash holdings (CHOLD); the value of correlation is -0.28.

Some independent variables are also found correlated with each other. Size and executive compensations are found to be positively correlated as the correlation value is 0.33. Director compensation and CEO compensation are also found positively correlated as evidenced from the value, 0.26. Executive compensation and managerial shareholding are negatively correlated; the value of their correlation is -0.27. The correlation value of firms' size and managerial shareholding is also -0.27.

The correlation analysis evidenced that there are inter-correlations among the explanatory variables like Size and Executive Compensation (0.333), CEO Compensation and Director Compensation (0.26). This shows the existence of multi-collinearity issues among the independent variables. When we run a multiple regression model we assume that there is no perfect linear relationship between the independent variables. This can also be stated as the absence of perfect multi-collinearity. If it exists in data, it leads to the fact that the regression model cannot give estimates for the population parameters. We first employed Variance Inflation Factor (VIF) to check the severity of multi-collinearity among the independent variables. For two variables it can be calculated by the following formula:

$$VIF = \frac{1}{1 - R_i^2} \dots\dots\dots Eq. (i)$$

Here  $R_i^2$  is the coefficient of determination of the regression equation that runs between two certain variables. If the value of VIF is below 4 or 5, we can say that the severity of multi-collinearity is ignorable. We applied it on our data as it has been observed that the VIF value of size of the firm and executive compensation is 0.8912 and the VIF value of CEO compensation and Director Compensation is 2.108. As these values are less than 4, we are sure that there is no issue of multi-collinearity among these variables.

**Underlying methodology**

The data consist of both cross sectional and time series data, therefore yearly panels of the data have been developed. We estimated the following multiple regression model.

$$CHOLD_{it} = \alpha_{it} + \beta_1CECOM_{it} + \beta_2DRCOM_{it} + \beta_3EXCOM_{it} + \beta_4LEV_{it} + \beta_5MHOLD_{it} + \beta_6SZ_{it} + \epsilon_i \dots\dots\dots Eq. (ii)$$

In this equation:

- CHOLD = Corporate Cash Holdings
- CECOM = CEOs Compensation
- DRCOM = Directors Compensation
- EXCOM = Executive Compensation
- LEV = Leverage
- MHOLD = Managerial Shareholdings
- SZ = Firm Size

**Results**

The results of regression equation (ii) carried out on panel data are reported in Table 3 and discussed in this section. The probability (F-Statistic) of the model is 0.00 which shows that the model is highly significant. Value of R square is 0.53, which shows that the dependent variable is 53% explained by these independent variables. The regression model is run in e-views with the assumption of White cross-section standard errors and covariance (d.f. corrected). It allows general contemporaneous correlation between the firm residuals. The

**Table 3.** Regression results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CECOM	0.037536	0.008797	4.266839	0.0000
DRCOM	-0.003743	0.001973	-1.896828	0.0585
EXCOM	0.008135	0.007274	1.118351	0.2641
LEV	-2.675364	0.238869	-11.20013	0.0000
MHOLD	-1.699251	0.171600	-9.902392	0.0000
SZ	0.979959	0.004601	212.9897	0.0000
C	-2.345401	0.272149	-8.618076	0.0000
R-squared	0.531872	Mean dependent var		18.05940
Adjusted R-squared	0.525071	S.D. dependent var		2.378510
F-statistic	78.20633	Prob(F-statistic)		0.000000

word “cross-section” is employed to mention that covariance is allowed across cross-sections.

The regression results as presented in the annexed Table 3 showing that CEO compensation is highly significant in explaining the corporate cash holdings of the KSE listed companies. The value of its t-Statistic is 4.26 with a P value of 0.00. Director compensation is significantly negative in explaining the corporate cash holdings; however, its relationship is slightly weak. The value of its t-Statistic is -1.89 at a 5.85% confidence level. Executive compensation had insignificant relationship with corporate cash holdings. T-statistic is 1.11 at a P-value of 0.26.

Leverage has negatively and significant relationship with corporate cash holdings; the value of its t-statistic is -11.20 at a P-value of 0.00. This showed that as the leverage of the firms increased it affected the corporate liquidity policy of the firms in a negative manner. The managerial shareholding has also highly negatively and significant relationship with corporate cash holdings. The value of its t-statistic is -9.90 and the P-value is 0.00.

However, size of the firms has highly positively significant relationship with corporate cash holdings as evidenced from the value of t-statistic, 212.98. This shows that the large firms hold cash in bulk.

We further employed an Auxiliary Regression between the squared residuals of the regression results (dependent variable) and all the independent variables of the regression model as mentioned in equation (ii). This regression is run to check the existence of Heteroskedasticity among the variables. The auxiliary regression equation is estimated as under:

$$RES^{*2} = \alpha_{it} + \beta_1 CECOM_{it} + \beta_2 DRCOM_{it} + \beta_3 EXCOM_{it} + \beta_4 LEV_{it} + \beta_5 MHO$$

$$LD_{it} + \beta_6 SZ_{it} + \varepsilon_i \dots \dots \dots Eq. (iii)$$

The results of auxiliary regression reported in Table 4 showed that no independent variable has a significant relationship with the squared residuals of the regression model. This ensured the non-existence of heteroskedasticity among the variables.

## Conclusion

This study is conducted with an objective to explore the relationships among corporate cash holdings (corporate liquidity policy) and compensation incentives offered by the KSE listed non-financial companies to their CEOs, Directors and Executives, keeping in view the managerial shareholding of the firm, leverage and the size of the firms represented by its net assets. We employed data of non-financial sectors of Karachi Stock Exchange for the periods of 2009 to 2010. We have fixed the issues of multi-collinearity and heteroskedasticity, if any. The results suggested that the CEO Compensation and Executive Compensation has a significant positive relationship with the corporate cash holdings. The size of the firm, which is employed as a control variable, also has a significant positive relationship with corporate cash holdings. But with these results we also found that leverage and managerial shareholdings have a significant negative relationship with the corporate cash holdings. It is concluded that the management of the companies does have influence on corporate cash holdings positively, but at the expense of debt holders, as we have observed a negatively significant relationship between leverage and corporate cash holdings viz-a-viz corporate liquidity policy. Another important conclusion drawn from

**Table 4.** Auxiliary regression results.

Dependent Variable: RES^2				
Method: Panel Least Squares				
Sample: 2009 2011				
Cross-sections included: 140				
Total panel (balanced) observations: 420				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CECOM	0.076044	0.055497	1.370248	0.1714
DRCOM	-0.011005	0.041743	-0.263634	0.7922
EXCOM	0.034860	0.054590	0.638588	0.5234
LEV	1.552650	1.203240	1.290391	0.1976
MHOLD	1.081830	0.947810	1.141399	0.2544
SZ	0.275223	0.194511	1.414949	0.1578
C	-6.194319	4.366128	-1.418721	0.1567
R-squared	0.015948	Mean dependent var		2.642037
Adjusted R-squared	0.001652	S.D. dependent var		5.065805
F-statistic	1.115526	Prob (F-statistic)		0.352292

the observed results is that managerial shareholdings are influencing the corporate cash holdings in a significantly negative manner. Managers having shared in the ownership of the companies tend to influence the corporate liquidity policy of the companies.

These results are consistent with today's theory on the relationships between compensation incentives of the firms' management and corporate liquidity policy. However, further research in Pakistani perspective is essentially required to make clear understanding of these relationships, keeping in view the other determinants of corporate liquidity policy, that is, firms' age, industry factors, access to capital markets, growth opportunities and riskier cash flows.

### Conflict of Interests

The authors have not declared any conflict of interests

### REFERENCES

- Acharya VV, Almeida H, Campello M (2007). Is cash negative debt: A hedging perspective on corporate financial policies. *J. Financial Intermediation*, 16:515–554.
- Al-Amareh A (2015). Corporate Cash Holdings and Financial Crisis: Evidence from Jordan. *Int. Bus. Res.* 8(5).
- Bates TW, Kahle K, Stulz R (2009). Why Do U.S. Firms Hold so Much More Cash than They. *J. Financ.* 64:1985-2021.
- Bigelli M, Sánchez-Vidal J (2012). Cash holdings in private firms. *J. Banking Finance*, 36:26-35.
- Di H, Hanke S (2013). The impact of double taxation on small firms' cash holdings. *Appl. Financ. Econ.* 23(16):1349-1359.
- Dittmara A, Mahrt-Smith J (2007). Corporate governance and the value of cash holdings. *J. Financial Econ*, 83: 599-663.
- Faulkender M, Wang R (2006). Corporate Financial Policy and the Value of Cash. *J. Financ* 61:1957-1990.
- Francis B, Gupta A, Hasan I (2015). Impact of compensation structure and managerial incentives on bank risk taking. *Eur. J. Oper. Res.* 242(2):651-676.
- Harford J, Mansi SA, Maxwell WF (2008). Corporate governance and firm cash holdings in the US. *J. Financial Econ.* 87:535-555.
- Islam S (2012). Manufacturing Firms' Cash Holding Determinants: Evidence from Bangladesh. *Int. J. Bus. Manage.* 7(6).
- Isshaq Z, Bokpin GA, Onumah JM (2009). Corporate governance, ownership structure, cash holdings, and firm value on the Ghana Stock Exchange. *J. Risk Finance*, 10(5):488-499.
- Jin L (2002). CEO compensation, diversification, and incentives. *J. Financial Econ.* 66:29-63.
- Kato T, Kubo K (2006). CEO compensation and firm performance in Japan: Evidence from new panel data on individual CEO pay. *J. Jpn. Int. Econ.* 20:1-19.
- Liu Y, Mauer D (2011). Corporate cash holdings and CEO compensation incentives. *J. Financial Econ.* 102(1):183-198.
- McCormack J (2008). Selecting the "Best" Government-Sponsored Defined Benefit Annuity: An Example Using the Teacher Retirement System of Texas: New research documents the impact of multiple factors on cash flows from annuities in defined benefit plans. *Compensation Benefits Rev.* 40(1):28-34.
- O' Dowd A (2008). Cash incentives might help to change behavior, MPs told. *BMJ*, 336(7652):1036-1036.
- Opler T, Pinkowitz L, Stulz RH, Williamson R (1999). The determinants and implications of corporate cash holdings. *J. Financ. Econ.* 52:3-46.
- Ozkan A, Ozkan N (2004). Corporate cash holdings: An empirical investigation of UK companies. *J. Banking Finance*, 28: 2103–2134.
- Quigley J (2008). Compensation and Incentives in the Mortgage Business. *Economists' Voice* 5(6).
- Shah SZA, Javed T, Abbas M (2009). Determinants of CEO Compensation, Empirical Evidence from Pakistani Listed Companies. *Int. Res. J. Financ. Econ. Issue* 32.
- Tong Z (2010). CEO Risk Incentives and Corporate Cash Holdings. *J. Bus. Finance Account.* 37: 1248-1280.
- Yu H, Sopranzetti B, Lee C (2013). The impact of banking relationships, managerial incentives, and board monitoring on corporate cash holdings: an emerging market perspective. *Rev. Quantit. Financ. Account.* 44(2):353-378.